ScienceCache: Engaging citizen scientists in data collection through geocaching

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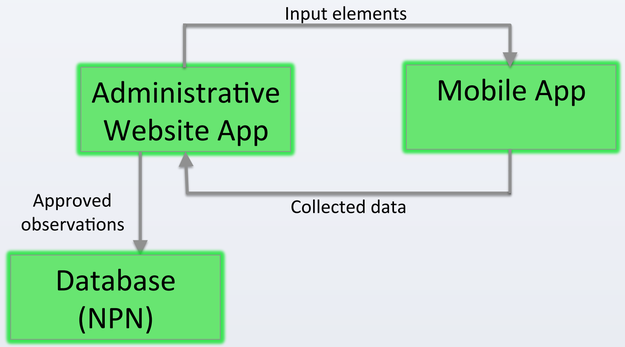
Goal: Facilitate Data Collection and Management and Citizen Engagement

(targeting geocachers, youth, and potentially others)



The Website App: Project Initiation and Data Management

Scientists will use the website to set up or import the database, associate fields with questions, and create geocaches using locations, educational material, and other auxiliary information.

We will address:

- Paperwork Reduction Act
- Privacy maximization (unique id keys or names)
- Security (screen photos, report feature for inappropriate photos)
- Transferability (2 pilots)

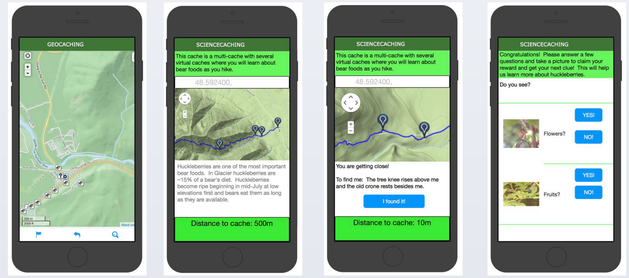
The Database: Data Storage

Data will flow initially into a project database and later be deposited into ScienceBase, National Phenology Network (NPN), BISON, or other appropriate enterprise database where it will be more widely available.

The Mobile App: Data collection

The app will include geocaching-like features to make it fun and educational for the user. Components will include:

- Initial screen with general safety information
- Location fences that can be used to periodically add location specific training or gamification components
- Pre/post trip download/upload capability for use in cellular deserts
- Ability to report inappropriate photos



Data Quality

Options for improve and assess data quality will include:

- Integrated training that may include pictures or videos
- The ability to record pictures of plants, landscapes, geological formations, instruments/gauges, etc.

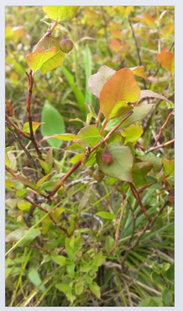
Pilot: Huckleberry Phenology in Glacier National Park

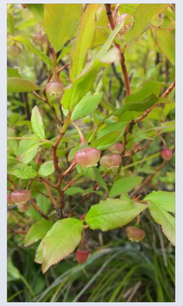
Climate change impacts on bear foods, especially berries are poorly understood. This study will assess the mechanisms and conditions influencing berry productivity and failure.

One potential geo-cache site that might have a clue such as: 'the tree knee rises above me and an old crone rests beside me'

Data quality

- Build on NPN tested protocols
- Positive reinforcement of plant identification through plant tags (subject to GNP compliance)
- Request photo of the shrub





Feedback Previous photos of the same plant, earlier in the year and in previous years.

Data Will flow into NPN

Beta-testing: Repeat photography of landscape

Dan Fagre, Climate Scientist, will help ensure both the website and mobile app are transferable by creating a project evaluating landscape change. This photo shows a ribbon forest invaded by trees that has also experienced a whitebark pine die-off.